

# NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

May 15, 2012

# Precipitation and Snowpack

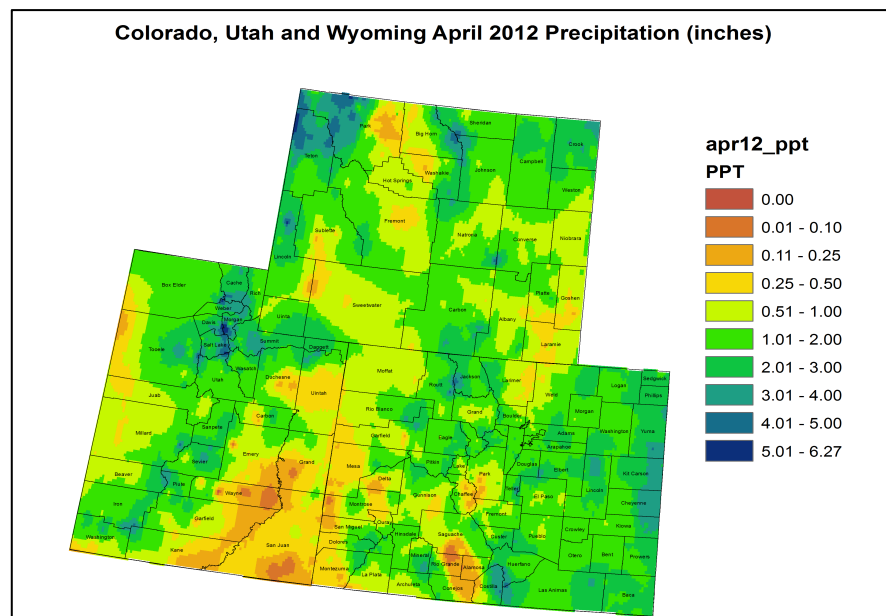


Fig. 1: April precipitation in inches.

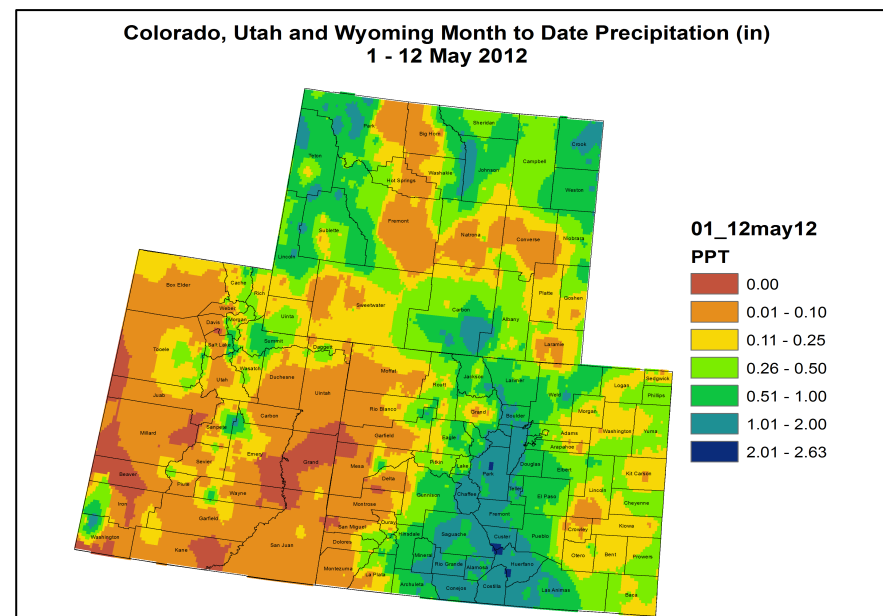
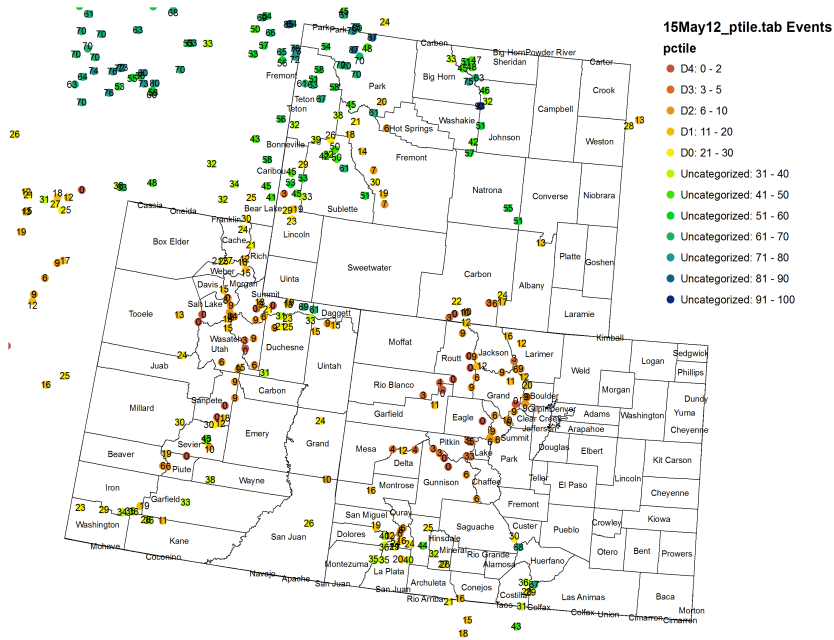


Fig. 2: May 1 – 12 precipitation in inches.

For the month of April, the Upper Colorado River Basin (UCRB) higher elevations saw precipitation amounts ranging between 1 and 3 inches, with spotty amounts of over 3 inches in the Wasatch mountains in Utah (Fig. 1). The lower elevations of western Colorado and eastern UT received amounts ranging between a quarter inch and 1 inch, with the Colorado River valley just above Lake Powell receiving less than a quarter inch for the month. Most of CO, east of the UCRB, received between 1 and 2 inches of precipitation, though short-term dryness shows up in northern CO and in the South Park valley for the month. The San Luis Valley was also drier, seeing less than a quarter of an inch for the month.

For the month of May so far, the heaviest precipitation has been concentrated along the Front Range of CO and just east of the Continental Divide, with many of those areas, including the San Luis Valley, receiving between 1 and 2 inches of moisture (Fig. 2). Higher elevations in the UCRB have received between a quarter and half an inch for the month, but most of the lower elevations have seen less than a tenth of an inch. Eastern CO has received between a tenth and a half inch of precipitation since the beginning of the month.

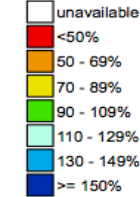
Snotel Water Year Precipitation Percentile Ranking for  
14 May 2012 (Stations with 15+ years of data only)



Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

May 14, 2012

Current Snow Water  
Equivalent (SWE)  
Basin-wide Percent  
of 1971-2000 Normal



\* Data unavailable  
at time of posting  
or measurement  
is not representative  
at this time of year

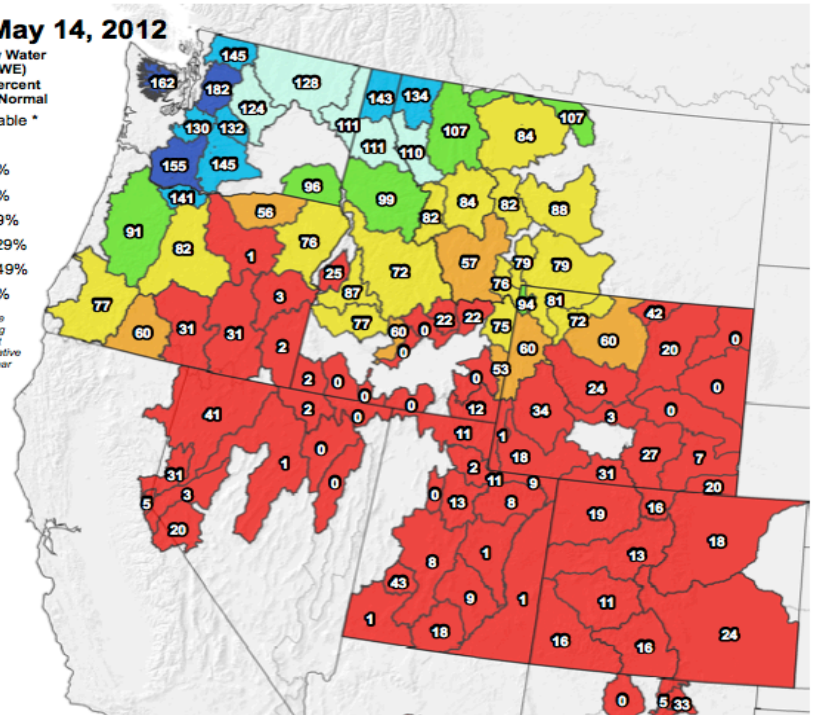


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

Fig. 4: Basin snow water equivalent (SWE) as a percent of average.

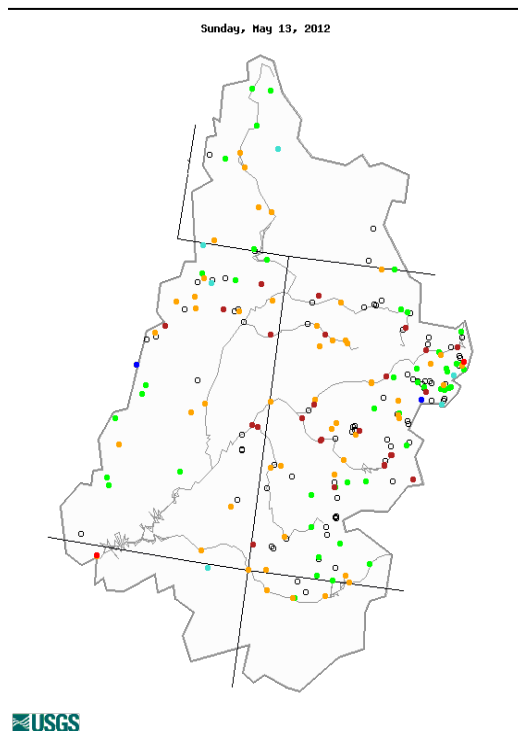
Water-year-to-date (WYTD), SNOTEL precipitation percentiles are lowest for the Yampa and Gunnison basins in CO, with many sites reporting in the lowest 5<sup>th</sup> percentile or below (Fig. 3). The Wasatch range in UT and the northern mountains of CO are also dry, with most precipitation percentiles in the teens. SNOTEL percentiles in the Upper Green basin in WY are generally above the 40<sup>th</sup> percentile. In the San Juan basin, many SNOTEL percentiles are above the 30<sup>th</sup> percentile, but there are also several SNOTEL sites reporting below the 30<sup>th</sup> percentile.

Snowpack conditions around the UCRB are all well below average and many sites have completely melted out (Fig. 4). This is a combined result of less than average seasonal snowpack accumulations and much earlier melting (seasonal peaks one month earlier than normal). Nearly all of the sub-basins are below 20% of average. The lowest averages are in eastern UT where little to no snow remains. In the northern-most part of the UCRB in WY, one sub-basin is recording 34% of average snowpack.

# Streamflow

As of May 13<sup>th</sup>, 41% of the USGS streamgages in the UCRB recorded normal (25<sup>th</sup> – 75<sup>th</sup> percentile) or above normal 7-day average streamflows (Fig. 5). Only 5% of the gages in the basin are recording above normal flows, while about 58% of the gages in the basin are recording below normal flows. The majority of the gages on all seven of the major rivers in the basin are now showing below normal flows, with many gages on the Colorado and Gunnison rivers showing much below normal flows. The streamgage just above Lake Powell is currently recording low flows. Many of the near normal flow recordings are at gages near the Colorado and Blue River headwaters.

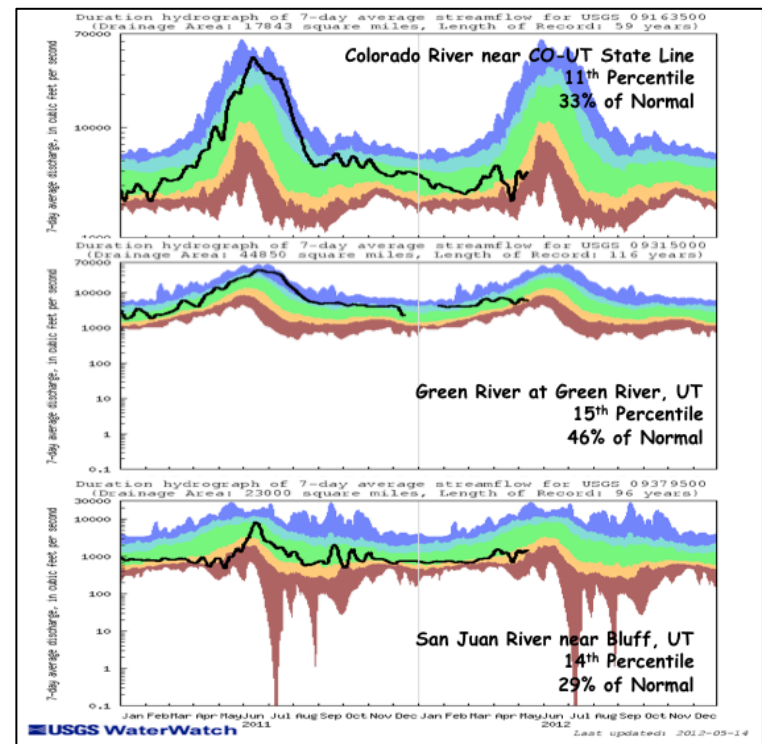
Flows on two key gages in the UCRB have remained fairly steady for the past week, while one increased (Fig. 6). Flows on the Colorado River near the CO-UT state line increased slightly and is currently at the 11<sup>th</sup> percentile. Flows on the Green River near Green River, UT and the San Juan River near Bluff, UT are at the 15<sup>th</sup> and 14<sup>th</sup> percentiles, respectively. All three gages are currently recording in the below normal range.



Explanation - Percentile classes							
<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: white;">○</span>	
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 5: 7-day average discharge compared to historical discharge for May 13<sup>th</sup>.

Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).



# Water Supply and Demand

Most of the UCRB experienced temperatures about 2 to 6 degrees above average for the week. All of eastern CO experienced cooler than average temperatures last week. The VIC model shows extremely dry soil moisture conditions for almost all of the UCRB (Fig. 7). Very dry soils in the lowest 5<sup>th</sup> percentile are modeled in western CO, eastern UT, and much of southern WY. Near normal soil moisture conditions are showing up over the Colorado River headwaters in the VIC model, though actual soils there are very dry. Dry soils are also evident through much of northeast and southeast CO.

All of the reservoirs above Lake Powell are currently near or above their May storage averages. Flaming Gorge and Blue Mesa have seen storage volume decreases since the beginning of the month. All other reservoirs have seen volume increases in May, though increases are generally less than the normal large increases that are observed this time of year. Lake Powell is currently at 79% of average and 64% of capacity (compared to 52% of capacity at the same time one year ago). Daily inflows in to the major reservoirs in the basin are much below average for this time of year.

## Precipitation Forecast

A strong ridge of high pressure will remain anchored over the desert southwest through much of the week and lead to mostly dry conditions across the UCRB. Minor disturbances embedded in the flow will brush the northern section of the basin and bring a slight chance of convection to the highest peaks of northern CO. Expect any showers that do form to remain high based with gusty winds and little precipitation. A more significant trough (with near average temperatures) will approach the UCRB this weekend, however this system will also be moisture starved and will only result in light showers and thunderstorms, again favoring the north. Liquid accumulations may approach 0.25 inches over the northern CO and eastern UT mountains by Saturday while other areas receive little in the way of precipitation (Fig. 8). Strong ridging will then rebuild through the beginning of next week with a return to dry conditions and above average temperatures.

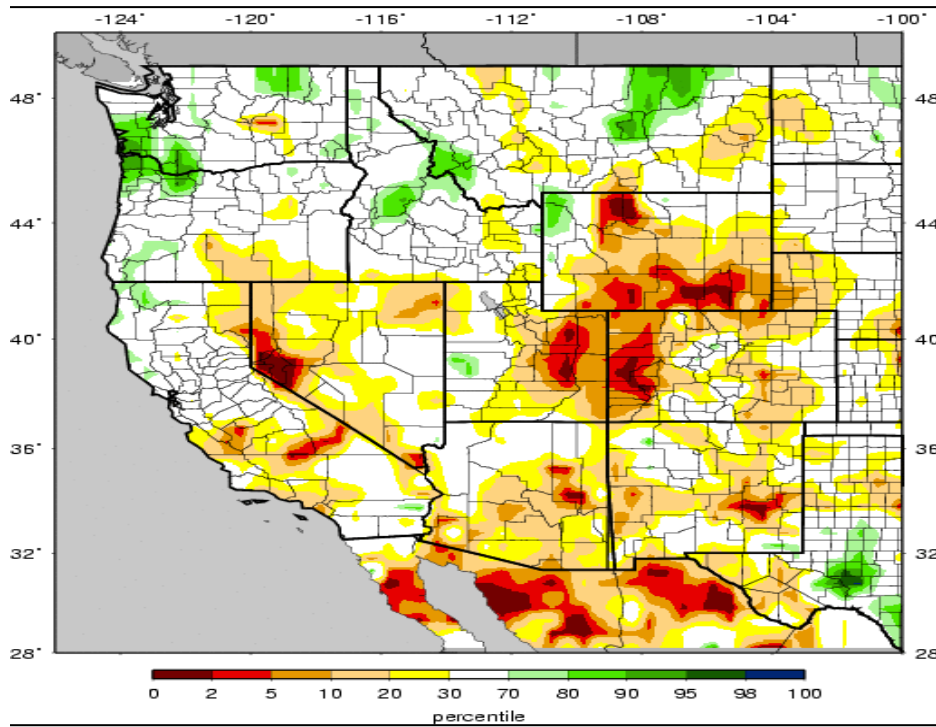


Fig. 7: VIC soil moisture percentiles as of May 13<sup>th</sup>, with total moisture storage (SWE and soil moisture) below.

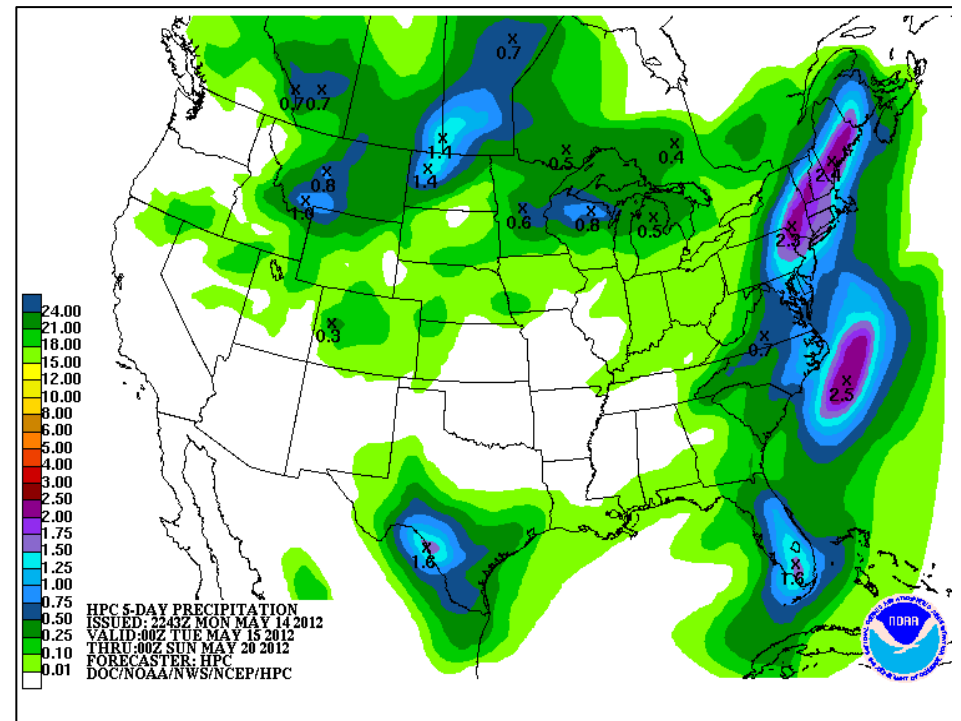


Fig. 8: Hydrologic Prediction Center's Quantitative Precipitation Forecast (QPF) through 00UTC Sunday.



# Drought and Water Discussion

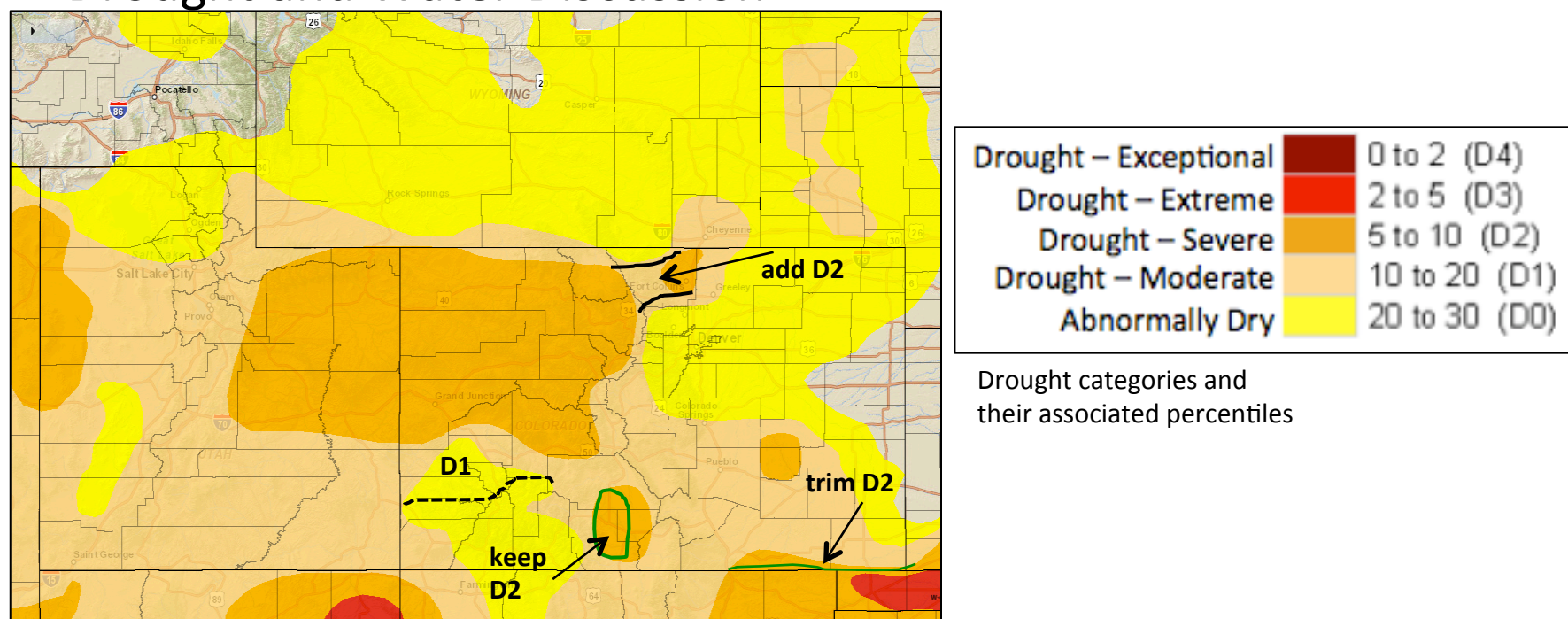


Fig. 9: May 8<sup>th</sup> release of U.S. Drought Monitor for the UCRB.

Several changes are recommended for the current U.S. Drought Monitor (USDM) map depiction (Fig. 9). In the UCRB, a D1 expansion to cover all of Montrose, San Miguel and Ouray counties is recommended based on SPIs and SNOTEL precipitation percentiles (Fig. 9, dashed black line). Status quo is recommended for the rest of the UCRB at this time.

In northern CO, a D2 expansion is recommended in Larimer County where recent rains have done little to help the extremely dry soils in the higher elevations (Fig. 9, solid black lines). In southern CO where recent beneficial rains have fallen, slight improvements to D2 are recommended (Fig. 9, green lines). In the San Luis Valley, conditions on the west side of the valley are considered drier, so D2 should remain, but the eastern portion of the D2 can be trimmed. Also, D2 can be trimmed out of Baca County and be limited to the extreme southern edge of Las Animas County.